

POLLY DRUMMOND HILL ROAD TRAIL CROSSING

RECTANGULAR RAPID FLASHING BEACON DEPLOYMENT

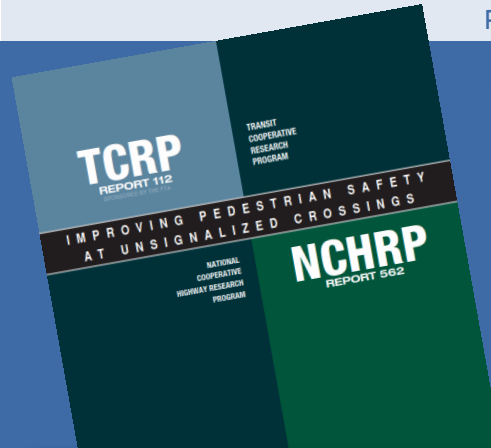


DelDOT Winter Workshop
FEBRUARY 16, 2016



Uncontrolled Ped & Trail Crossings

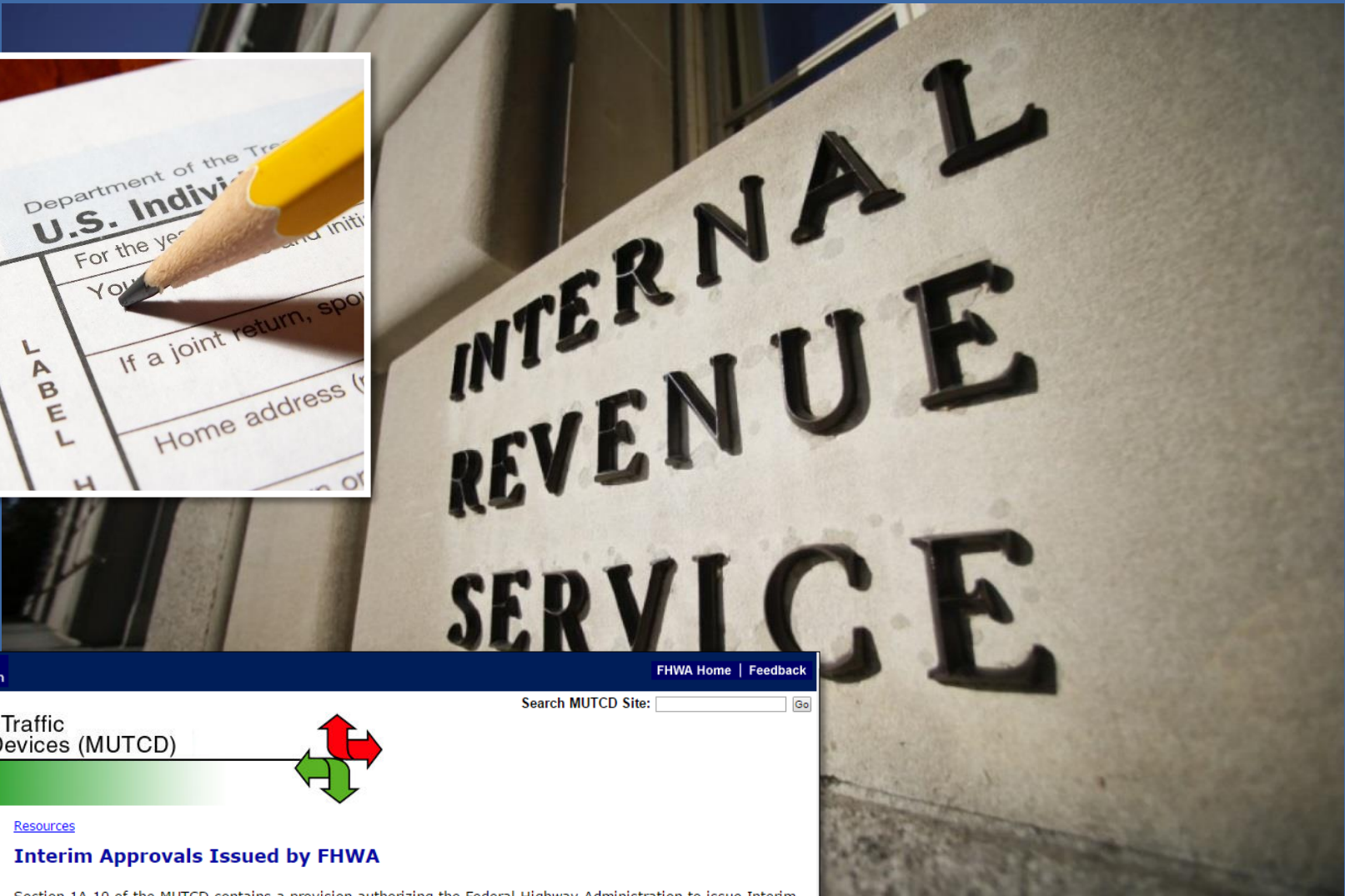
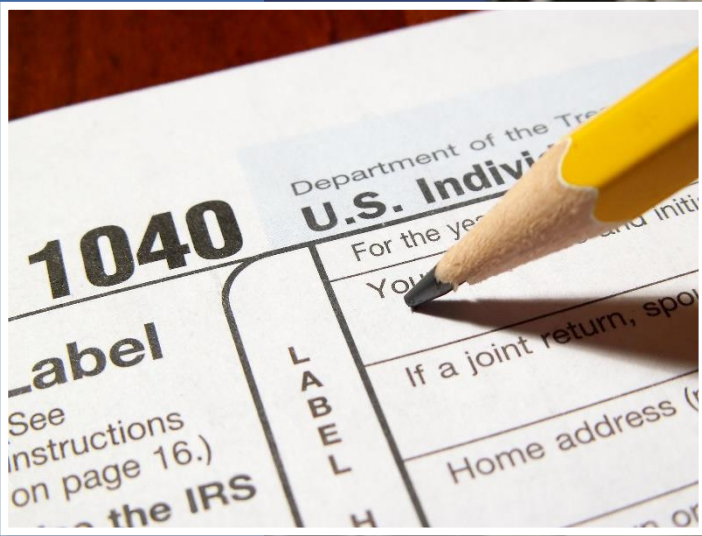
POLLY DRUMMOND HILL ROAD R R F B




- Geometric treatments
- Static signing and pavement markings
- “Enhanced” static (e.g., in-road signs and lights)
- Active warning devices
- Red signal displays

Deciphering the Feds

POLLY DRUMMOND HILL ROAD RRFB



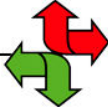
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 U.S. Department of Transportation
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Search MUTCD Site:

Manual on Uniform Traffic Control Devices (MUTCD)



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Knowledge
Overview
Evolution of the MUTCD
Who Uses the MUTCD
2009 Edition with Revisions 1 and 2

Resources
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Interim Approvals Issued by FHWA
Section 1A.10 of the MUTCD contains a provision authorizing the Federal Highway Administration to issue Interim Approvals. Such approvals allow the interim use, pending official rulemaking, of a new traffic control device, a revision to the application or manner of use of an existing traffic control device, or a provision not specifically described in the MUTCD. Interim Approvals are considered by the Office of Transportation Operations based on the results of successful experimentation, studies, or research, and an intention to place the new or revised device into a future rulemaking process for MUTCD revisions.

P O L L Y D R U M M O N D H I L L R O A D R R F B

July 16, 2008 — Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11)

- (HTML PDF 347KB)
- RFBF [H...]
- allowable Uses:
- An RFBF shall only be used to supplement a W11-2 (Pedestrian) or S1-1 (School) crossing warning sign w
 - An RFBF shall not be used for crosswalks across approaches controlled by YIELD signs, STOP signs, or tra
 - An RFBF shall not be used for crosswalks at which RFBFs are used less than deemed neede
- d. In the event sight distance approaching the crosswalk at all other RFBFs are used is less than deemed neede
- a W11-2 (Pedestrian) or S1-1 (School) crossing warning sign with an AHEAD: (W16-9p) plaque. This addi
- Sign/Beacon Assembly Locations:
- For any approach on which RFBFs are used, two W11-2 or S1-1 crossing warning signs (each with RFBF On a divided highway, the left-hand side assembly should be installed on the median, if practical, rathe
 - All RFBFs and Placement in Sign Assembly:
 - A RFBF shall not be installed independent of the crossing signs for the approach the RFB faces. The
- Beacon Dimensions and Placement in Sign Assembly:
- Each RFBF shall consist of two rectangular-shaped yellow indications, each with an LED-array based l
 - The two RFBF indicators shall be aligned horizontally, with the longer dimension horizontal and with
 - The outside edges of the RFBF indications, including any housings, shall not project beyond the out
 - As a specific exception to 2003 MUTCD Section 4K.01 guidance, the RFBF shall be located between
- sign, the AHEAD plaque), rather than 12 inches above or below the sign assembly. ([See attached.](#))
- Beacon Flashing Requirements:
- When activated, the two yellow indications in each RFBF shall flash in a rapidly alternating "wig-
 - As a specific exception to 2003 MUTCD Section 4K.01 requirements for the flash rate of beacon
 - have alternating but approximately equal periods of rapid pulsing light emissions and dark ones indication shall emit three rapid pulses of light.
 - The flash rate of each individual yellow indication shall meet the minimum specifications of Society
 - The light intensity of the yellow indications shall initiate operation only upon pedestrian actuation, an
 - Dated January 2005.
- Beacon Operation:
- The RFBF shall be normally dark, shall initiate operation only upon pedestrian actuation, and
 - All RFBFs associated with a given crosswalk (including those with an advance crossing sign
 - If pedestrian pushbuttons (rather than passive detection) are used to actuate the RFBFs, a
 - The duration of a predetermined period of operation of the RFBFs following each actuat
 - The light directed at and visible to pedestrians in the crosswalk may be installed inte
 - e. A small light directed at and visible to pedestrians in the crosswalk may be installed inte
- Other:
- Except as otherwise provided above, all other provisions of the MUTCD applicable to w

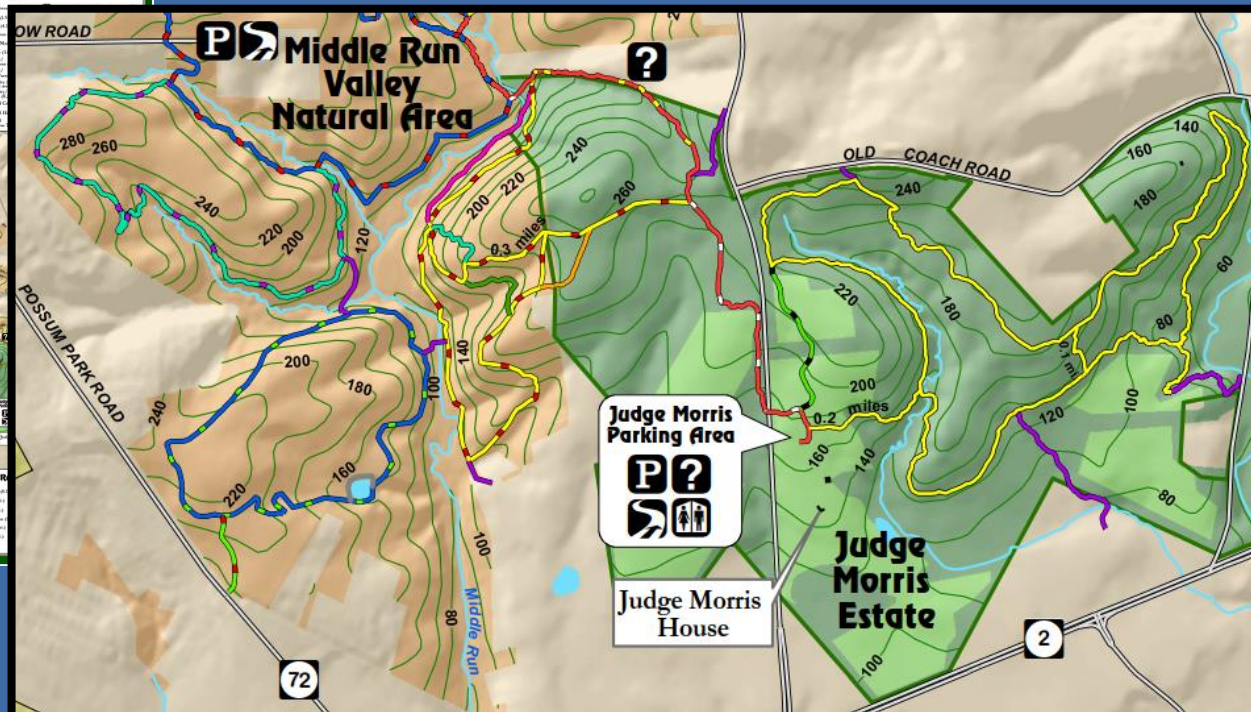
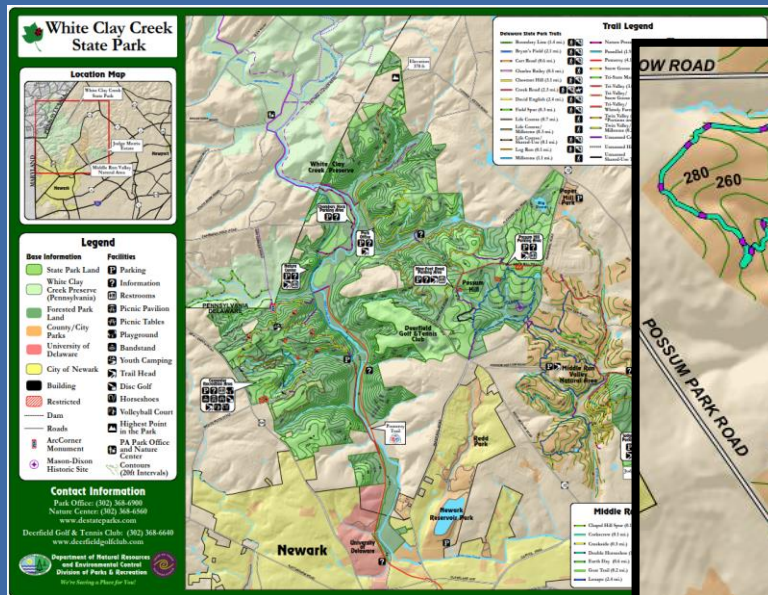


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- DelDOT
Delaware Department of Transportation

Project History

POLLY DRUMMOND HILL ROAD R R F B

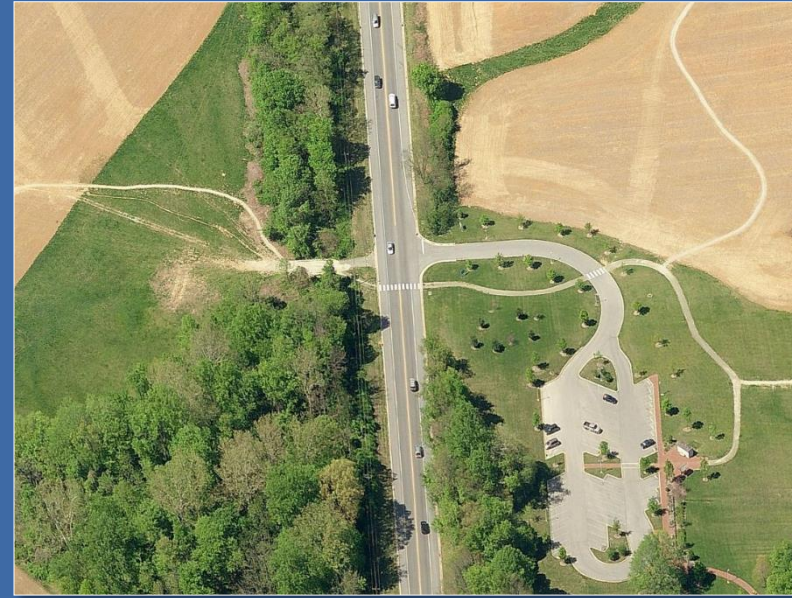
- Existing connection from Judge Morris trails (with parking) to Middle Run
- February 2015 legislative request, including raucous support from bicycling advocates and DNREC
- Long-term recommendation to eliminate uncontrolled crossing and provide signalized crossing farther north at Old Coach Road
 - *"It was not feasible to expect everybody to go a mile out of their way to cross the street."* (while exercising?!?)



Evaluation Criteria

POLLY DRUMMOND HILL ROAD R R F B

- Marked crosswalk with numerous static bike, ped, and cross traffic warning signs
- AADT: 18,000 veh/day (**PM peak: 1,600 veh/hr**)
- Prevailing speeds: 49 mph (NB) & 52 mph (SB)
- Grade: 7 to 9 percent within stopping distance

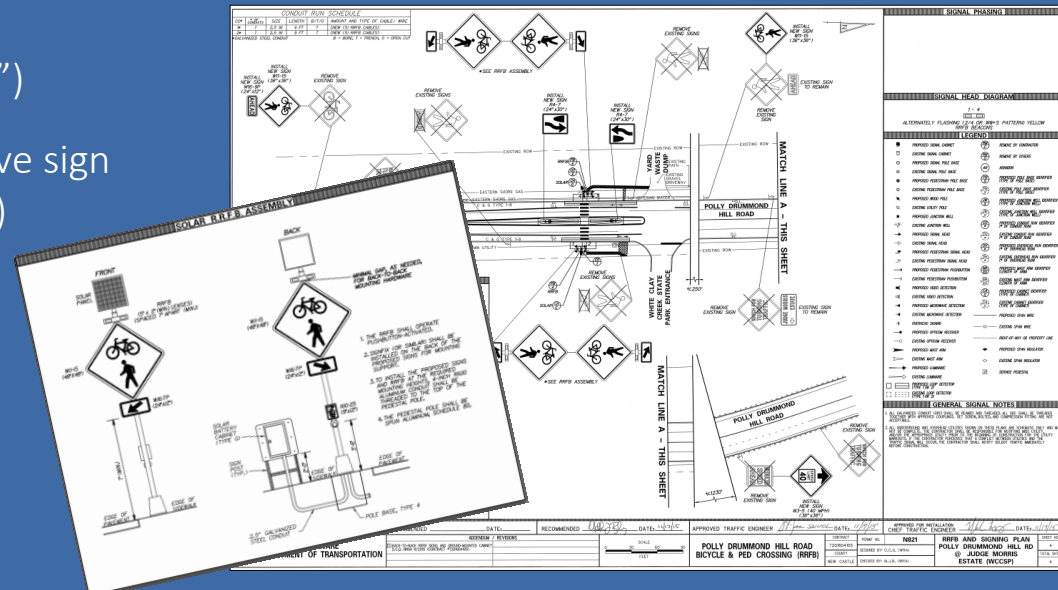


- Undivided roadway with full-width shoulders
- Side-street traffic conflicts due to parking lot and DNREC yard waste site
- Intersection frequently littered with debris (mulch, dirt, branches)
- Reported long delays for safe gaps in two-way traffic

Traffic Control Device & Geometric Design

POLLY DRUMMOND HILL ROAD RRFB

- Lane shifts to accommodate new median refuge island for two-stage crossing
- Full-depth shoulder reconstruction
- Conservative turning paths for yard waste trucks, landscape trailers
- Procurement of solar-powered RRFBs with wireless communication link
 - Crashworthy, self-contained assemblies
 - Special circuit for new wig-wag and simultaneous flash pattern (“WW+S”)
 - New beacon mounting position above sign (pending 8th “official interpretation”)
- Permeable (EcoGrid) pull-off area for signal maintenance personnel due to elimination of full-width shoulders



Next Steps

P O L L Y D R U M M O N D H I L L R O A D R R F B

- Anticipated construction completion late March 2016
- Evaluate “before” video monitoring (**158 hours!**) for ped/bike delays and motorist compliance
- Conduct “after” free-flow speed study
 - “Before” speed study supports current 50-mph posted speed limit
 - “After” speeds may be lower due to new concrete median refuge island and lane shifts
- Perform “staged” crossings for “after” conditions
 - **“Before” compliance rates of only 3 and 5 percent** for SB and NB, respectively



Additional Pilot Locations & Studies

P O L L Y D R U M M O N D H I L L R O A D R R F B

- Traffic and Planning collaboration for assessment and RRFB deployment at 14 additional pilot locations
- Statewide locations with varying traffic flow, geographic, environmental, and geometric conditions (e.g., resort areas, wooded trails, urban locations, school crossings)
- Conduct before and after studies for motorist compliance using plain-clothed “staged” crossings
 - Consistent with Texas A&M Transportation Institute’s procedures and guidelines
 - Provides uniform basis for research and data collection
- Deploy “general population” (i.e., not staged) video monitoring for before and after ped/bike observations – e.g., pushbutton usage, measured delays

Acknowledgments

P O L L Y D R U M M O N D H I L L R O A D R R F B

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